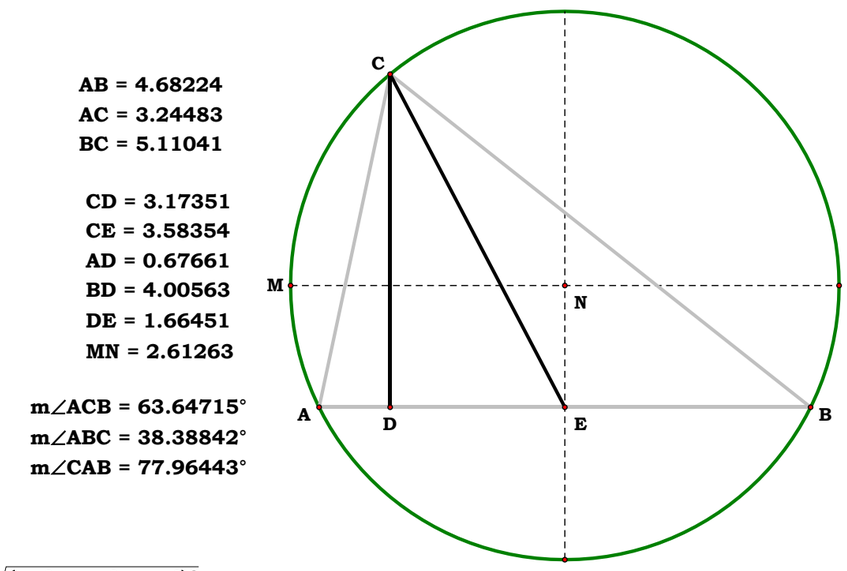
Pythagoras In and Out

Friday, June 30, 2023

Early in my learning by writing equations to figures, it became clear to me that I would have to go beyond Pythagoras, and learn how to function using any triangle. Every triangle can be circumscribed by a circle, and every triangle is determined by trigonometry measure, to consist of 180 degrees, therefore, one should be able to work with any triangle as one does a right triangle, i.e., the right triangle is only one case of any triangle.



$$AD - \frac{\sqrt{(AB^2 + AC^2 - BC^2)^2}}{2 \cdot AB} = 0.00000$$

$$BD - \frac{\sqrt{(AB^2 - AC^2 + BC^2)^2}}{2 \cdot AB} = 0.00000$$

$$DE - \frac{\sqrt{(AC^2 - BC^2)^2}}{2 \cdot AB} = 0.00000$$

$$CE - \frac{\sqrt{2 \cdot AC^2 - AB^2 + 2 \cdot BC^2}}{2} = 0.00000$$

$$CD - \frac{\sqrt{(AB + AC + BC) \cdot (AB + AC - BC) \cdot (AB - AC + BC) \cdot (AC - AB + BC)}}{2 \cdot AB} = 0.00000$$

$$\frac{AB}{2 \cdot MN} - \sin(m\angle ACB) = 0.00000$$

$$\frac{AC}{2 \cdot MN} - \sin(m\angle ABC) = 0.00000$$

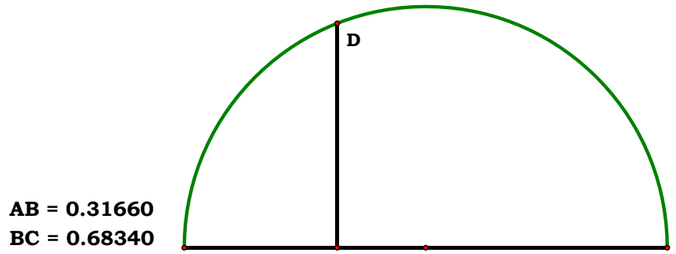
$$\frac{BC}{2 \cdot MN} - \sin(m\angle CAB) = 0.00000$$

$$(AC^2 + BC^2) - \left(\frac{AB^2}{2} + 2 \cdot CE^2\right) = 0.00000$$

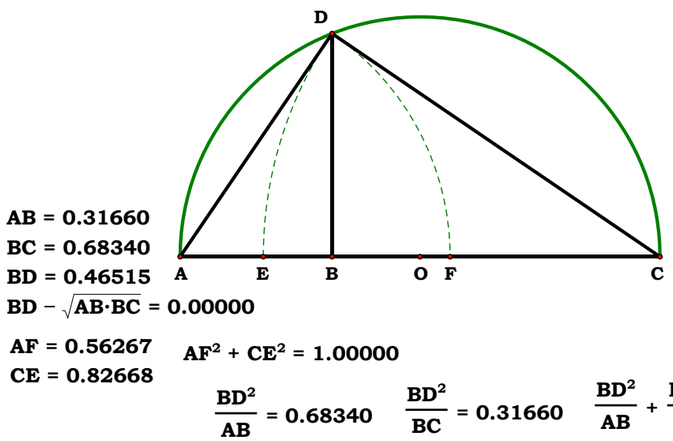
My results led me to state, that the so-called Pythagorean Theorem, which is not a theory, is not technically correct, for we work with any triangle, and the right triangle is only a special case. I found everything I was looking for, even the correct equation relating the squares on the sides of any triangle back in 1993.

I also demonstrated the fallacy and mythologies of Trigonometry, as one can see by the equations using the angle. There is no requirement for a right-angle and every segment can be stated in the function of the sine, which makes the obfuscation of Trig, and it's violation of definitions, rather a pointless waste of time. Just trying to read that junk sends chills down my back, pure garbage. Reasoning is the product of binary recursion, i.e., via the standardization of a unit.

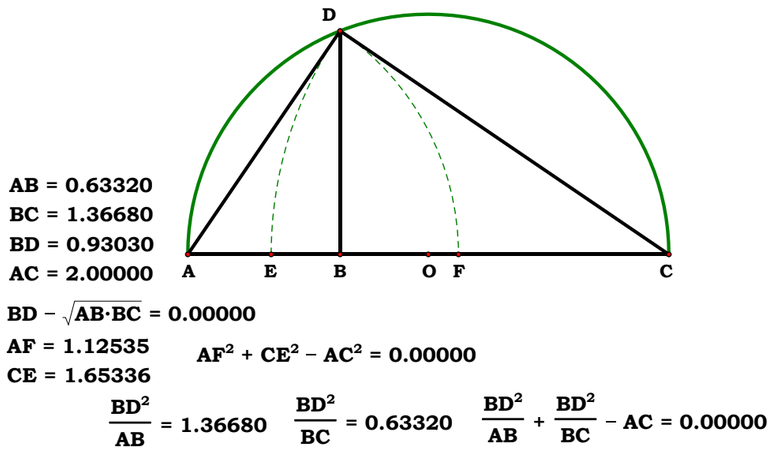
And as I am engaged in trying to do a rewrite of the Elements, one aimed at the universal concepts of language applied to our grammar matrix, I decided that as I started at the end of a triangle in 1993, i.e., the three sides, that formally, one should start at the beginning with the ratio, itself.



Now, it is not actually obvious what one is looking at here. What one actually has is that BD is a ratio to twice the radius of a circle. Now this means that something else should also be true. These are the traditional equations for a circle. However, do these equations comply with the definition of the circle?

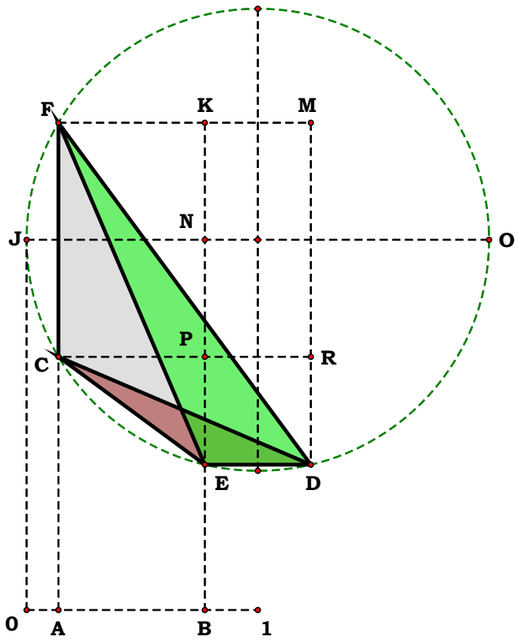


The traditional method is okay for most applications in which one mixes units, but it will not work in a formal presentation, a diameter is always in terms of twice the unit. If one can comprehend that, then one can better understand how to write up equations for every possible triangle using just the two ratio's on any line in a circle, i.e. every line in a circle is the product of two ratio's to the radius. That will aid you in understanding the simplicity of Pythagoras In and Out Mathcad writeup.



I have now corrected Pythagoras from both directions. So, the entire triangle is simply the result of only two ratio's, and thus complies with definition.

Find the equations for any triangle in a circle, length of its sides, its height, and the area of the triangls using the two radial roots.



0 = 0.00000
1 = 1.00000
A = 0.13776
B = 0.77080

CF = 1.01301
CD = 1.18710
CE = 0.78658
EF = 1.60959
DE = 0.45840
DF = 1.83883
EK = 1.47988
EP = 0.46688
FM = 1.09144

Area CDF = 0.55282
Area CDE = 0.10701
Area DEF = 0.33919

Unit = 1.00000

$CF - \left(2\cdot\sqrt{A\cdot(2-A)}\right) = 0.00000$

$CD - \sqrt{2\cdot\left(A\cdot B - B - A + 2 - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$CE - \sqrt{2\cdot\left(A + B - A\cdot B - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$EF - \sqrt{2\cdot\left(A + B - A\cdot B + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$DE - 2\cdot(1 - B) = 0.00000$

$DF - \sqrt{2\cdot\left(A\cdot B - B - A + 2 + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$EK - \left(\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)}\right) = 0.00000$

$EP - \left(\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)}\right) = 0.00000$

$FM - (2 - B - A) = 0.00000$

$(\text{Area CDF}) - \left((2 - B - A)\cdot\sqrt{A\cdot(2-A)}\right) = 0.00000$

$(\text{Area CDE}) - \left((1 - B)\cdot\left(\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)}\right)\right) = 0.00000$

$(\text{Area DEF}) - \left((1 - B)\cdot\left(\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)}\right)\right) = 0.00000$

Descriptions.

$A := .13776 \quad B := .77080 \quad JO := 2$

$KN := \sqrt{A\cdot(2-A)} \quad CF := 2\cdot KN \quad CP := B - A$

$EN := \sqrt{B\cdot(2-B)} \quad EK := EN + KN$

$DE := 2\cdot(1-B) \quad FM := 2 - B - A \quad EP := EN - KN$

$CE := \sqrt{CP^2 + EP^2} \quad CD := \sqrt{FM^2 + EP^2}$

$EF := \sqrt{CP^2 + EK^2} \quad DF := \sqrt{FM^2 + EK^2}$

$hDFE := EK \quad aDFE := (1-B)\cdot EK$

$hCDE := EP \quad aCDE := (1-B)\cdot EP$

$hCDF := FM \quad aCDF := FM\cdot KN$

Definitions.

$A - A = 0 \quad B - B = 0 \quad JO - 2 = 0 \quad KN - \sqrt{A\cdot(2-A)} = 0 \quad CF - 2\cdot\sqrt{A\cdot(2-A)} = 0 \quad CP - (B - A) = 0$

$EN - \sqrt{B\cdot(2-B)} = 0 \quad EK - \left[\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)}\right] = 0 \quad DE - 2\cdot(1-B) = 0 \quad FM - (2 - B - A) = 0$

$EP - \left[\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)}\right] = 0 \quad CE - \sqrt{2\cdot\left(A + B - A\cdot B - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0$

$CD - \sqrt{2\cdot\left(A\cdot B - B - A + 2 - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0 \quad EF - \sqrt{2\cdot\left(A + B - A\cdot B + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0$

$DF - \sqrt{2\cdot\left(A\cdot B - B - A + 2 + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0 \quad hDFE - EK = 0 \quad hCDE - EP = 0 \quad hCDF - FM = 0$

$aDFE - (1-B)\cdot\left[\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)}\right] = 0 \quad aCDE - (1-B)\cdot\left[\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)}\right] = 0 \quad aCDF - (2 - B - A)\cdot\sqrt{A\cdot(2-A)}$

0 = 0.00000
1 = 1.00000
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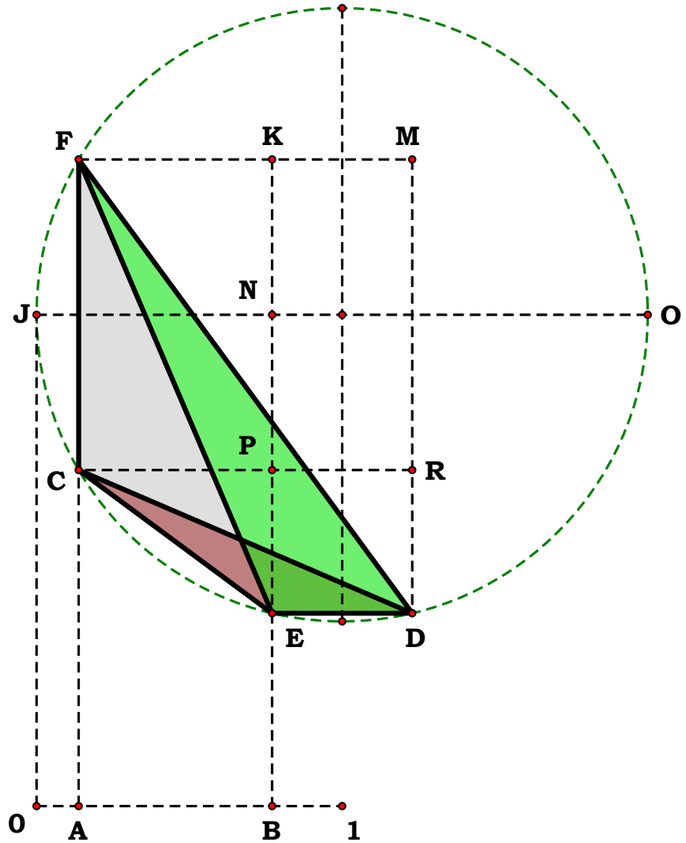
B = 0.77080

CF = 1.01301
CD = 1.18710
CE = 0.78658
EF = 1.60959
DE = 0.45840
DF = 1.83883
EK = 1.47988
EP = 0.46688
FM = 1.09144



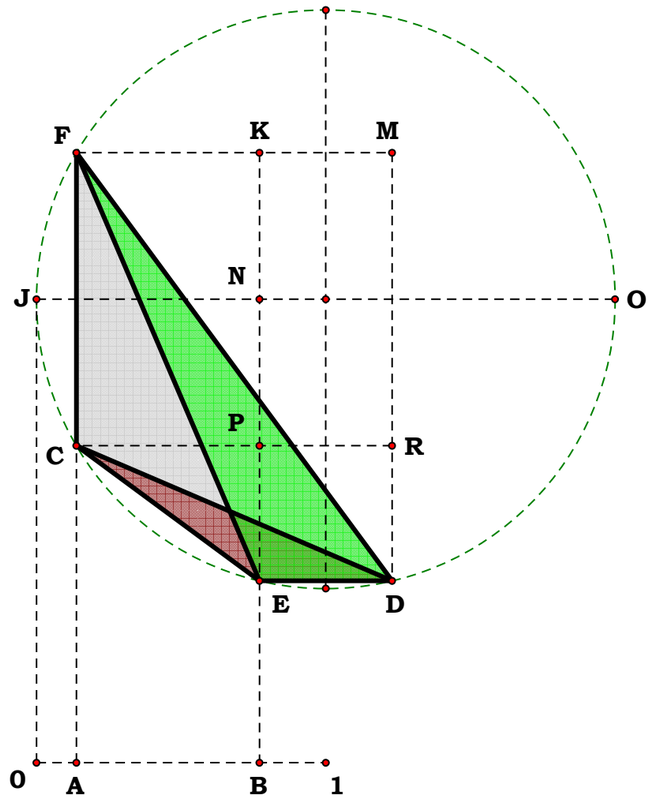
Unit = 1.00000

m∠CDF = 30.43121°
m∠CFD = 36.40946°
m∠CFE = 23.15933°
m∠EDF = 53.59054°
m∠DFE = 13.25012°
m∠DCE = 13.25012°
m∠DCF = 113.15933°

$\frac{CF}{2}$ − sin(m∠CDF) = 0.00000
$\frac{CD}{2}$ − sin(m∠CFD) = 0.00000
$\frac{CE}{2}$ − sin(m∠CFE) = 0.00000
$\frac{EF}{2}$ − sin(m∠EDF) = 0.00000
$\frac{DE}{2}$ − sin(m∠DCE) = 0.00000
$\frac{DE}{2}$ − sin(m∠DCE) = 0.00000
$\frac{DF}{2}$ − sin(m∠DCF) = 0.00000

0 = 0.00000
1 = 1.00000
A = 0.13776
B = 0.77080

CF = 1.01301
CD = 1.18710
CE = 0.78658
EF = 1.60959
DE = 0.45840
DF = 1.83883
EK = 1.47988
EP = 0.46688
FM = 1.09144



Area CDF = 0.55282
Area CDE = 0.10701
Area DEF = 0.33919

Unit = 1.00000

$CF - \left(2\cdot\sqrt{A\cdot(2-A)}\right) = 0.00000$

$CD - \sqrt{2\cdot\left(A\cdot B - B - A + 2 - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$CE - \sqrt{2\cdot\left(A + B - A\cdot B - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$EF - \sqrt{2\cdot\left(A + B - A\cdot B + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$DE - 2\cdot(1 - B) = 0.00000$

$DF - \sqrt{2\cdot\left(A\cdot B - B - A + 2 + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2}\right)} = 0.00000$

$EK - \left(\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)}\right) = 0.00000$

$EP - \left(\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)}\right) = 0.00000$

$FM - (2 - B - A) = 0.00000$

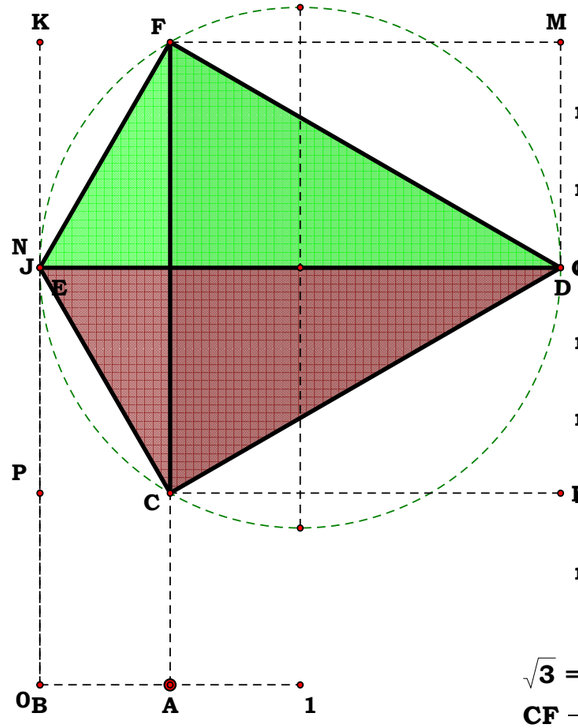
$(\text{Area CDF}) - \left((2 - B - A)\cdot\sqrt{A\cdot(2-A)}\right) = 0.00000$

$(\text{Area CDE}) - \left((1 - B)\cdot\left(\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)}\right)\right) = 0.00000$

$(\text{Area DEF}) - \left((1 - B)\cdot\left(\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)}\right)\right) = 0.00000$

0 = 0.00000
1 = 1.00000
A = 0.50000
B = 0.00000

CF = 1.73205
CD = 1.73205
CE = 1.00000
EF = 1.00000
DE = 2.00000
DF = 1.73205
EK = 0.86603
EP = 0.86603
FM = 1.50000



Unit = 1.00000

m∠CDF = 60.00000°
m∠CFD = 60.00000°
m∠CFE = 30.00000°
m∠EDF = 30.00000°
m∠DFE = 90.00000°
m∠DCE = 90.00000°
m∠DCF = 60.00000°

$\sqrt{3}$ = 1.73205
CF − $\sqrt{3}$ = 0.00000

$\frac{CF}{2}$ − sin(m∠CDF) = 0.00000
$\frac{CD}{2}$ − sin(m∠CFD) = 0.00000
$\frac{CE}{2}$ − sin(m∠CFE) = 0.00000
$\frac{EF}{2}$ − sin(m∠EDF) = 0.00000
$\frac{DE}{2}$ − sin(m∠DCE) = 0.00000
$\frac{DE}{2}$ − sin(m∠DCE) = 0.00000
$\frac{DF}{2}$ − sin(m∠DCF) = 0.00000

CF − $(2\cdot\sqrt{A\cdot(2-A)})$ = 0.00000
CD − $\sqrt{2\cdot(A\cdot B - B - A + 2 - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2})}$ = 0.00000
CE − $\sqrt{2\cdot(A + B - A\cdot B - \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2})}$ = 0.00000
EF − $\sqrt{2\cdot(A + B - A\cdot B + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2})}$ = 0.00000
DE − 2·(1 − B) = 0.00000
DF − $\sqrt{2\cdot(A\cdot B - B - A + 2 + \sqrt{2\cdot A - A^2}\cdot\sqrt{2\cdot B - B^2})}$ = 0.00000
EK − $(\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)})$ = 0.00000
EP − $(\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)})$ = 1.73205
FM − (2 − B − A) = 0.00000
(Area CDF) − $((2 - B - A)\cdot\sqrt{A\cdot(2-A)})$ = 0.00000
(Area CDE) − $((1-B)\cdot(\sqrt{B\cdot(2-B)} - \sqrt{A\cdot(2-A)}))$ = 1.73205
(Area DEF) − $((1-B)\cdot(\sqrt{B\cdot(2-B)} + \sqrt{A\cdot(2-A)}))$ = 0.00000

Area CDF = 1.29904
Area CDE = 0.86603
Area DEF = 0.86603